

Conducting the P2 Audit

One way facilities subject to the final PFPR rule can determine which compliance option to choose is to use a four-part process: (1) conduct a P2 audit, (2) make preliminary compliance decisions, (3) evaluate wastewater treatment technologies, and (4) make and document final compliance decisions. This chapter discusses the P2 audit and how a facility can use that tool to make preliminary decisions on which compliance strategy to choose. Chapters 5 and 6 present the ways in which a facility can treat the wastewater remaining after the P2 practices have been implemented and evaluate the economic impacts of wastewater treatment compared to contract hauling. Chapter 7 presents ways for facilities to make and document their final compliance decisions.

A comprehensive P2 opportunities assessment (or audit) is the first step in implementing an effective P2 program and in determining compliance with the final rule. **However, this P2 audit is not required by the rule and is not mandatory.** The P2 audit described in this chapter focuses on water use and wastewater generation. This audit is not designed to be a comprehensive P2 audit, as it does not fully evaluate solid waste and air emissions; however, it will assist users in identifying PFPR wastewater sources and P2, recycle, and reuse practices and in making compliance decisions for the PFPR effluent guidelines and standards. For information on P2 audit tools that will help you analyze your solid waste and air emissions, see the resources listed in Chapter 9.

Each PFPR facility will need to make an initial choice of how to comply with the regulation. A facility may choose to either comply with the zero discharge effluent limitation/pretreatment standard *or* implement the P2 alternative (practices listed in Table 8 of the final rule plus wastewater treatment when necessary). The choice of zero discharge or the P2 alternative can be made on either a facility-wide basis or on a process

The P2 Audit

Completing a P2 audit is not mandatory, but may be helpful to:

- Decide whether to comply with the P2 alternative or the zero-discharge option;
- Assess whether a facility is in compliance with the P2 alternative;
- Identify production changes that could result in cost savings;
- Identify P2, recycle, and reuse opportunities for wastewater discharges; and
- Organize paperwork documenting compliance with the P2 alternative.

P2 Alternative

The P2 alternative permits a “P2 allowable discharge” as an alternative to zero discharge of process wastewater when facilities implement the specific P2 practices listed in Table 8 of Appendix A of this manual and wastewater treatment when necessary. These practices reduce the amount of active ingredients and other raw materials lost in wastewater discharges, and may also decrease the volume of PFPR process wastewater generated.

basis (i.e., product family/process line/process unit). Facilities that implement the P2 alternative will also need to agree to make the practices and the P2 discharge allowance enforceable.

The tools presented in this chapter to conduct a P2 audit are based on the practices included in the effluent limitations guidelines and standards for the PFPR industry as well as other P2 practices that are in use in the PFPR industry. The audit may be used to identify waste sources at the point of generation and to match each source with applicable P2, recycle, and reuse practices. Identifying these P2 opportunities can help facilities reduce costs even when not choosing to comply with the P2 alternative.

The P2 audit tables discussed in this chapter (Tables A through C) and the wastewater treatment tables presented in Chapter 6 (Tables D and E) are offered as one way to conduct an audit and/or to demonstrate compliance with the P2 alternative. **It is not required that facilities, permittees, or other auditors use these tables.** However, the tables discussed in this chapter summarize the types of information that are useful in conducting a P2 opportunities assessment. Since it is very difficult to construct one table or checklist with a format useful for all PFPR facilities, EPA hopes that the tables presented in this manual are a useful tool as they are, or can be adapted in whatever way the user feels is appropriate. P2 audit tables are available in an electronic format in Excel 5.0 and may be requested from Shari Zuskin of EPA's Engineering and Analysis Division (see Chapter 9 for fax, E-mail, and/or mailing address).

The information necessary to complete the tables may be collected in a variety of ways. Much of the information may already be available in production records, state P2 plans, stormwater plans, *inventory management systems*, or facility permits. In addition, the information gathered for the checklist may also be used to help complete other types of plans (e.g., stormwater or state P2 plans) in the future.

P2 Audit Tables		
Table	Title	Purpose
Table A	Identification of Wastewater Sources	Helps users summarize in detail potential wastewater sources through review of process operations.
Table B	Evaluation of PFPR P2, Recycle, and Reuse Practices	Helps users summarize in detail P2, recycle, and reuse practices, and evaluate their current use, whether they can be implemented by the facility, and any required modifications.
Table C	Summary of PFPR Compliance Decisions	Helps users summarize the compliance decision for each wastewater source identified in Table A. The completion of the P2 audit results in a <i>preliminary</i> compliance decision for each source.

Nonpesticide Operations and Industries

A P2 audit is also useful in identifying wastewater P2 opportunities in other industries, such as those industries listed to the right. In fact, many PFPR facilities also engage in formulating and packaging of these nonpesticide products. Although the P2 audit tables are designed specifically for the PFPR industry, the P2 opportunities listed may be advantageous for other operations and industries.

- Other chemicals formulating, packaging, and repackaging;
- Pharmaceuticals;
- Animal feed products;
- Cosmetics; and
- Fertilizers.

The P2 audit tables are designed for use by PFPR facility managers, POTWs, permit writers and other regulatory agency representatives, federal and state auditors, and consultants (referred to as the “user” throughout this chapter).

Example pages of the audit tables (completed for a fictitious facility) are shown throughout this chapter to illustrate the types of information captured on the tables. The blank tables are presented in their entirety in Appendix B. Specific P2 equipment and practices listed on the table instructions in *italicized, bold* print are defined in the P2 glossary in Chapter 3.

Conducting The Audit

In order to thoroughly assess P2, recycle, and reuse opportunities, detailed information pertaining to all source identification and P2, recycle, and reuse practices must be available to the user. This information is best obtained through interviews with facility personnel, review of facility records, and first-hand observation via a plant tour. The user can also incorporate, where applicable, any personal knowledge of or experience with the facility. It is helpful to review all information with facility personnel so that data gaps may be filled, and to discuss facility-specific benefits or problems associated with implementation of different P2, recycle, and reuse practices. Some of the information, such as wastewater generation volumes and frequency, may not be readily available the first time such an audit is completed; however, over time a facility may implement systems to track these types of data to facilitate future P2 assessments.

Each page of the P2 audit tables has space to enter the name and location of the facility, the name of the user, and the date the audit is completed.

Table A: Identification of Wastewater Sources

Table A of the P2 audit is not only the starting point but also the focal point of the P2 audit. The wastewater streams and sources identified on Table A will be linked to potential P2 opportunities on Table B and waste management options in Chapter 6. Completing this table will enable facility personnel to begin assessing whether to choose to comply with the P2 alternative, and if so, whether to comply on a facility-wide basis or on a product family/process line/process unit basis.

Table A is used to identify all PFPR wastewater sources at the facility and to gather general operations and treatment information (e.g., frequency of wastewater generation) about each source. The table includes a comprehensive list of the wastewater streams and sources found in the PFPR industry; however, space is also included for additional wastewater streams that may be identified for a specific facility. Three steps that can be used to complete Table A are detailed below.

Step 1: Identify Wastewater Stream Types and Sources

The user should take time to accurately and completely identify all PFPR wastewater stream types and sources at the facility. Figure 4-1 presents an example of the types of information collected while completing Step 1. In particular, the unshaded columns “Stream Type”, “Source”, and “Comments” illustrate this example.

Table A. Identification of Wastewater Sources

Facility: _____		Location: _____						
Date: _____		Prepared by: _____						
Stream Type	Source	Batch or Continuous	Volume Generated	Generation Frequency	Active Ingredients	Wastewater Matrix ¹	Wastewater Management ²	Comments
1. Shipping Container/ Drum Cleaning - water or solvent rinses of the containers used to ship raw material, finished products, and/or waste products prior to reuse or disposal of the containers.	1.a. atrazine, metolachlor, and inert drums							20 drums of atrazine, 5 drums of metolachlor, and 5 drums of inerts used each week.
	1.b. copper naphthenate and solvent drums							5 drums of copper naphthenate and 5 drums of solvent used each week.
2. Bulk Tank Rinsate - cleaning of the interior of any bulk storage tank containing raw materials, intermediate blends or finished products associated with PFPR operations.	2.a.							Stream type not generated at this facility.
	2.b.							Stream type not generated at this facility.
3. Formulating Equipment Interior Cleaning - routine cleaning, cleaning due to product changeover, or special cleaning of the interior of any formulating equipment, including formulation and/or storage tanks, pipes, and hoses. Cleaning materials may include water, detergent, or solvent.	3.a. liquid formulation tank # 1							Herb. #1/#2: tank rinsed w/ water (TD) Fungicide: tank rinsed with solvent (RE), then water (TD)
	3.b. liquid formulation tank # 2							Herb. #1/#2: tank rinsed w/ water (TD) Fungicide: tank rinsed with solvent (RE), then water (TD)
	3.c. liquid formulation tank # 3							Herb. #1/#2: tank rinsed w/ water (TD) Fungicide: tank rinsed with solvent (RE), then water (TD)
	3.d. dry formulation tank							Dry process line, rinsed monthly after sweeping.

¹ Inerts (e.g., emulsifiers, surfactants), solids, detergent, etc.

² RE=reuse, TR=treatment and reuse, TD=treatment and discharge, DI=indirect discharge, DD=direct discharge, IN=incineration, DP=off-site disposal

Figure 4-1. Identifying Wastewater Stream Types and Sources

The **“Stream Type”** column lists potential wastewater stream types. An entry of **“Other”** is also provided at the end of Table A for facility-specific waste stream types. It is most useful for the user and facility personnel to discuss each stream type to decide whether it exists at the facility. After consideration, if it is determined that a wastewater stream does not exist at the facility, the user can draw an **“X”** through the box in the **“Stream Type”** column. Any pertinent information (e.g., stream type not generated at facility, operation not performed at facility) can be noted in the **“Comments”** column. In the example shown in Figure 4-1, the facility does not have bulk tanks; therefore, bulk tank rinsate has been crossed off as a source.

Table A

If it is determined that the stream type does exist at the facility, the source of each stream type can be noted in the **“Sources”** column. In the example in Figure 4-1, it is noted in Box 3a that one source of wastewater from formulating equipment interior cleaning is a liquid formulation tank identified as Tank #1. In the **“Comments”** column, the user has also provided details on the number of times the tank is used in production and some details on the cleaning process.

Space is provided on Table A to include multiple sources of a single wastewater stream type. For example, Figure 4-1 presents information on two types of shipping container and drum rinsing operations that occur at the facility. If the checklist or similar form is being used to demonstrate compliance with the P2 alternative, the user should be as clear as possible when identifying sources of wastewater stream types. If abbreviations, process line numbers, production line codes, or other notations are used on the form to designate sources, the user should ensure that supporting information (e.g., process diagrams, process line names or products, and a key to the abbreviations) is attached to the table.

The **“Stream Type”** and **“Sources”** columns can be initially completed in the office prior to a plant tour by using prior knowledge of the facility and its operations. The stream types and sources listed can then be refined through discussions with facility personnel during a plant tour.

Step 2: Collect Operations Data

Operations information (e.g., how a wastewater is generated) should be weighed heavily when evaluating potential P2 opportunities. For example, if a waste stream is only generated in small volumes one time per year at the facility, then examining P2 practices for that waste stream may be a lower priority than a waste stream that is generated every day. Figure 4-2 presents an example of the types of information collected when completing Step 2. The unshaded portions of columns “**Batch or Continuous**”, “**Volume Generated**”, and “**Generation Frequency**” illustrate this example.

For each stream type and source identified, enter operations data on Table A. Indicate whether the waste stream is generated from a batch or continuous process by entering either a “B” for batch or a “C” for continuous in the “**Batch or Continuous**” column. Enter the volume (either batch volume or daily volume), including measurement units, generated in the “**Volume Generated**” column. Enter how often the wastewater is produced (e.g., once per day, once per year) in the “**Generation Frequency**” column. For example, in Figure 4-2, the user noted that the facility has a wastewater stream generated from a batch cleaning process for 55-gallon drums that contained atrazine. Five gallons of wastewater are generated per drum and 20 drums are cleaned weekly.

The accuracy of the operations information may vary from source to source. Many times, facility personnel may only have approximate waste stream volumes available. Through continued use of the P2 audit, however, the waste stream data should become more accurate, since operations data play an important role in deciding the most cost-effective compliance strategy.

Record pertinent information regarding operations data in the “**Comments**” column and, if necessary, attach to the form the key to any abbreviations or notations.

Table A

Table A. Identification of Wastewater Sources								
Facility: Date:		Location: Prepared by:						
Stream Type	Source	Batch or Continuous	Volume Generated	Generation Frequency	Active Ingredients	Wastewater Matrix ¹	Wastewater Management ²	Comments
1. Shipping Container/ Drum Cleaning - water or solvent rinses of the containers used to ship raw material, finished products, and/or waste products prior to reuse or disposal of the containers.	1.a. atrazine, metolachlor, and inert drums	B	5 gal/drum	30 drums per week				20 drums of atrazine, 5 drums of metolachlor, and 5 drums of inerts used each week.
	1.b. copper naphthenate and solvent drums	B	5 gal/drum	10 drums per week				5 drums of copper naphthenate and 5 drums of solvent used each week.
2. Bulk Tank Rinsate - cleaning of the interior of any bulk storage tank containing raw materials, intermediate blends, or finished products associated with PFPR operations.	2.a.							Stream type not generated at this facility.
	2.b.							Stream type not generated at this facility.
3. Formulating Equipment Interior Cleaning - routine cleaning, cleaning due to product changeover, or special cleaning of the interior of any formulating equipment, including formulation and/or storage tanks, pipes, and hoses. Cleaning materials may include water, detergent, or solvent.	3.a. liquid formulation tank # 1	B	50 gal/run	1 run/week				Herb. #1/#2: tank rinsed w/ water (TD) Fungicide: tank rinsed with solvent (RE), then water (TD)
	3.b. liquid formulation tank # 2	B	50 gal/run	2 runs/week				Herb. #1/#2: tank rinsed w/ water (TD) Fungicide: tank rinsed with solvent (RE), then water (TD)
	3.c. liquid formulation tank # 3	B	50 gal/run	1 run/week				Herb. #1/#2: tank rinsed w/ water (TD) Fungicide: tank rinsed with solvent (RE), then water (TD)
	3.d. dry formulation tank	B	100 gal	Monthly				Dry process line, rinsed monthly after sweeping.

¹ Inerts (e.g., emulsifiers, surfactants), solids, detergent, etc.

² RE=reuse, TR=treatment and reuse, TD=treatment and discharge, DI=indirect discharge, DD=direct discharge, IN=incineration, DP=off-site disposal

Figure 4-2. Collecting Operations Data

Step 3: Collect Waste Characterization Data

The quality and composition of the waste stream is directly related to the potential P2, recycle, and reuse practices that may be implemented by the facility. Therefore, the next step of a P2 audit is to collect waste characterization information (e.g., the constituents in the wastewater). This information may also be useful when exploring wastewater treatment technologies, as described in Chapter 5. As shown in Figure 4-3, the facility generates an interior equipment cleaning rinsate containing carbaryl, listed in Box 3d, from rinsing a dry formulation tank with water once per month. The facility is unable to reuse this wastewater in the formulation because the product is dry. However, they do sweep out the equipment prior to the water rinse to minimize the presence of pesticide in the wastewater.

The user should try to identify waste characterization data for each stream type and source identified on Table A. Enter the name or abbreviation for the active ingredients present in the waste stream in the “**Active Ingredients**” column. In some instances, the facility may use more active ingredients than can be listed in the space provided. In those cases, the user can attach a separate sheet listing additional active ingredients present in the waste stream. Next, record the other constituents (e.g., solids, solvents, detergents, emulsifiers) in the wastewater that may affect reuse or implementation of a P2 initiative under the “**Wastewater Matrix**” column. Finally, enter wastewater management and treatment information using the codes provided in the footnote in the “**Wastewater Management**” column. As shown in Figure 4-3, the facility discharges the carbaryl wastewater to a POTW without pretreatment.

Again, record any pertinent information regarding operations data in the “**Comments**” column and attach the key to any abbreviations or notations used on the table. The “**Comments**” column may also be used to note any unique aspects in the generation or handling of each source, including multiple discharge practices for the same source.

Table A. Identification of Wastewater Sources

Facility: _____		Location: _____						
Date: _____		Prepared by: _____						
Stream Type	Source	Batch or Continuous	Volume Generated	Generation Frequency	Active Ingredients	Wastewater Matrix ¹	Wastewater Management ²	Comments
1. Shipping Container/ Drum Cleaning - water or solvent rinses of the containers used to ship raw material, finished products, and/or waste products prior to reuse or disposal of the containers.	1.a. atrazine, metolachlor, and inert drums	B	5 gal/drum	25 drums per week	atrazine, metolachlor	water, inerts	RE	20 drums of atrazine, 5 drums of metolachlor, and 5 drums of inerts used each week.
	1.b. copper naphthenate and solvent drums	B	5 gal/drum	10 drums per week	copper naphthenate	water, solvent	DI	5 drums of copper naphthenate and 5 drums of solvent used each week.
2. Bulk Tank Rinsate - cleaning of the interior of any bulk storage tank containing raw materials, intermediate blends, or finished products associated with PFPR operations.	2.a.							Stream type not generated at this facility.
	2.b.							Stream type not generated at this facility.
3. Formulating Equipment Interior Cleaning - routine cleaning, cleaning due to product changeover, or special cleaning of the interior of any formulating equipment, including formulation and/or storage tanks, pipes, and hoses. Cleaning materials may include water, detergent, or solvent.	3.a. liquid formulation tank # 1	B	50 gal/run	1 run/week	atrazine, metolachlor, copper naphthenate	solvent, water, inerts	RE, TD	Herb. #1/#2: tank rinsed w/ water (TD) Fungicide: tank rinsed with solvent (RE), then water (TD)
	3.b. liquid formulation tank # 2	B	50 gal/run	2 runs/week	atrazine, metolachlor, copper naphthenate	solvent, water, inerts	RE, TD	Herb. #1/#2: tank rinsed w/ water (TD) Fungicide: tank rinsed with solvent (RE), then water (TD)
	3.c. liquid formulation tank # 3	B	50 gal/run	1 run/week	atrazine, metolachlor, copper naphthenate	solvent, water, inerts	RE, TD	Herb. #1/#2: tank rinsed w/ water (TD) Fungicide: tank rinsed with solvent (RE), then water (TD)
	3.d. dry formulation tank	B	100 gal	Monthly	carbaryl	water, solids	DI	Dry process line, rinsed monthly after sweeping.

¹ Inerts (e.g., emulsifiers, surfactants), solids, detergent, etc.

² RE=reuse, TR=treatment and reuse, TD=treatment and discharge, DI=indirect discharge, DD=direct discharge, IN=incineration, DP=off-site disposal

Figure 4-3. Collecting Waste Characterization Data

Table B: Evaluation of PFPR P2, Recycle, and Reuse Practices

Table B of the P2 audit is used to evaluate the P2, recycle, and reuse practices in place at the facility and to consider the feasibility of implementing additional P2, recycle, and reuse practices at the facility. Each facility subject to the final PFPR rule will have three options in choosing how to comply with the regulation: (1) comply with the zero discharge effluent limitation/pre-treatment standard, (2) incorporate the P2 practices listed in Table 8 of the final rule with wastewater treatment when necessary, or, (3) if the facility has an approved justification, incorporate the P2 practices with modifications and wastewater treatment when necessary. The column **“Table 8 Listed Practice”** lists the P2, recycle, and reuse practices found in the final rule (see Appendix A). A facility that wishes to discharge wastewater must incorporate these P2, recycle, and reuse practices into their process. The column entitled **“Practice”** describes recycle and reuse practices that are demonstrated in the PFPR industry. These practices include P2, recycle, and reuse practices from Table 8 of the final regulation and other recycle and reuse practices that PFPR facilities can choose to incorporate. The **“Comments”** column should be used to note any unique circumstances surrounding the facility-specific application of a particular P2 practice.

It is helpful if the person(s) conducting the P2 audit and completing Table B reads and understands the instructions for the intended use of Table B, and is familiar with the available P2 equipment and practices presented in Chapter 3. Table B will not only aid in deciding whether to choose the P2 alternative and in documenting current practices at the facility, but will also be a guide to implementing successful P2 practices. Four steps that can be used to complete Table B are detailed below.

Table B

Step 1: Identify Practices Reported by Facility

Figure 4-4 presents an example of the types of information recorded when completing Step 1. Page 3 of Table B is shown so that the P2 practices match the source codes from Page 1 of Table A (shown in Figures 4-1 through 4-3). The unshaded columns “Practice,” “Does Facility Use This Practice?,” and “Source Code from Table A” illustrate this example.

Table B

The “Table 8 Listed Practice” column cross-references the practices listed in Table B with the corresponding practices listed in Table 8 of the final regulation. If there is no corresponding practice in the final regulation, “NA” appears in the “Table 8 Listed Practice” column. The P2, recycle, and reuse practices listed in the “Practice” column in Table B should be discussed with plant personnel to identify if they are utilized by the facility. For each P2 practice the facility uses, note which facility operation implements the practice by transferring the source code from Table A into the “Source Code” column. In the “Does Facility Use this Practice?” column, answer “Yes” or “No.”

Table B. Evaluation of PFPR P2, Recycle, and Reuse Practices

Facility: _____ Date: _____				Location: _____ Prepared by: _____				
	Table 8 Listed Practice ¹	Practice	Does Facility Use this Practice?	Source Code from Table A	Extent of Use of this Practice Observed During Audit	Could Facility Implement this Practice in the Future?	Required Justification for Modification ²	Comments
7. Dedicated Equipment for Solvent- and Water-Based Products								
7-1	9	Facility dedicates PFPR production equipment to water-based vs. solvent-based products. Dedicated solvent-based or water-based equipment may be used on a non-routine basis for non-dedicated operations, but facility may not discharge the aqueous changeover rinsate as part of their P2 allowable discharge.	No	1,3,4				
8. Interior Rinsate Storage and Reuse								
8-1	10	Interior rinsate is stored for reuse in future formulations of the same or compatible product (note: does not include drum/shipping container rinsate).	Yes	3				
			No	3				
8-2	4	Dry carrier material is stored and reused in future formulation of the same or compatible product or disposed of as solid waste.	Yes	3				
8-3	4	Interiors of dry formulation equipment are cleaned with dry carrier prior to water rinse.	No	3.d				

¹ 40 CFR 455.67

² Insert the following modification codes in the column titled “Required Justification for Modification”:

ALTDISPOSE, BIOGROWTH, BREAKCAA, DETERGENT, DROP, INERT, NARROW, PACKAGE, RECOVERY, REFURB, SPACE, OTHER
(Modification Code Sheet at end of table contains a detailed explanation of each code.)

Figure 4-4. Identifying P2 Practices

Step 2: Identify Practices In Use

During the plant tour, note in the column entitled “Extent of Use of this Practice Observed During Audit” the locations and operations where each practice has been implemented. Figure 4-5 presents an example of the types of information a user may note while touring a facility. If a particular practice is not used (such as low-volume/high-pressure rinsing equipment or other flow reduction devices), answer “NA” in the “Extent of Use of this Practice Observed During Audit” column.

Table B

Table B. Evaluation of PFPR P2, Recycle, and Reuse Practices

Facility: _____				Location: _____				
Date: _____				Prepared by: _____				
	Table 8 Listed Practice ¹	Practice	Does Facility Use this Practice?	Source Code from Table A	Extent of Use of this Practice Observed During Audit	Could Facility Implement this Practice in the Future?	Required Justification for Modification ²	Comments
7. Dedicated Equipment for Solvent- and Water-Based Products								
7-1	9	Facility dedicates PFPR production equipment to water-based vs. solvent-based products. Dedicated solvent-based or water-based equipment may be used on a non-routine basis for non-dedicated operations, but facility may not discharge the aqueous changeover rinsate as part of their P2 allowable discharge.	No	1,3,4	NA			
8. Interior Rinsate Storage and Reuse					Fungicide formulation tank solvent rinsate is stored for reuse.			
8-1	10	Interior rinsate is stored for reuse in future formulations of the same or compatible product (note: does not include drum/shipping container rinsate).	Yes	3				
			No	3	NA			
8-2	4	Dry carrier material is stored and reused in future formulation of the same or compatible product or disposed of as solid waste.	Yes	3	Dry material is reused in product.			
8-3	4	Interiors of dry formulation equipment are cleaned with dry carrier prior to water rinse.	No	3.d.	NA			

¹ 40 CFR 455.67

² Insert the following modification codes in the column titled “Required Justification for Modification”:

ALTDISPOSE, BIOGROWTH, BREAKCAA, DETERGENT, DROP, INERT, NARROW, PACKAGE, RECOVERY, REFURB, SPACE, OTHER
(Modification Code Sheet at end of table contains a detailed explanation of each code.)

Figure 4-5. Identifying Use of P2 Practices

Step 3: Identify Practices That Could Be Implemented In The Future

During the plant tour, identify locations and operations where each practice could be implemented. Indicate “Yes” or “No” for each practice in the column entitled **“Could Facility Implement this Practice in the Future?”** If a particular practice is already in use at the facility, answer “NA” in this column. A facility may choose to implement a modification to a P2 practice listed in Table 8 of the final rule. In this case, the facility must write in the **“Required Justification for Modification”** column the appropriate code for the modification from Footnote 2. The list of codes and their explanations appears at the end of Table B. Use the **“OTHER”** code if the modification is not one that is listed in the final rule and describe the modification in the **“Comments”** column. Note that if the selected modification is not listed in the final rule, a facility must submit a request to the control authority or permitting authority for the modification and have it approved prior to implementing the modification. Figure 4-6 presents an example of the types of information recorded when completing Step 3.

Table B

Table B. Evaluation of PFPR P2, Recycle, and Reuse Practices

Facility: _____				Location: _____				
Date: _____				Prepared by: _____				
	Table 8 Listed Practice ¹	Practice	Does Facility Use this Practice?	Source Code from Table A	Extent of Use of this Practice Observed During Audit	Could Facility Implement this Practice in the Future?	Required Justification for Modification ²	Comments
7. Dedicated Equipment for Solvent- and Water-Based Products								
7-1	9	Facility dedicates PFPR production equipment to water-based vs. solvent-based products. Dedicated solvent-based or water-based equipment may be used on a non-routine basis for non-dedicated operations, but facility may not discharge the aqueous changeover rinsate as part of their P2 allowable discharge.	No	1,3,4	NA	Yes		Facility could dedicate one of the tanks to solvent-based products.
8. Interior Rinsate Storage and Reuse					Fungicide formulation tank solvent rinsate is stored for reuse.	NA		Solvent-based fungicide
8-1	10	Interior rinsate is stored for reuse in future formulations of the same or compatible product (note: does not include drum/shipping container rinsate).	Yes	3				
			No	3	NA	No	BIOGROWTH	For the water-based herbicides, facility has demonstrated evidence of biological growth over a typical
8-2	4	Dry carrier material is stored and reused in future formulation of the same or compatible product or disposed of as solid waste.	Yes	3	Dry material is reused in product.	NA		
8-3	4	Interiors of dry formulation equipment are cleaned with dry carrier prior to water rinse.	No	3.d.	NA	No		

¹ 40 CFR 455.67² Insert the following modification codes in the column titled “Required Justification for Modification”:ALTDISPOSE, BIOGROWTH, BREAKCAA, DETERGENT, DROP, INERT, NARROW, PACKAGE, RECOVERY, REFURB, SPACE, OTHER
(Modification Code Sheet at end of table contains a detailed explanation of each code.)

Figure 4-6. Identifying Future Use of P2 Practices

Step 4: Identify Information for the “Comments” Column

For each practice listed on Table B, additional information may be collected by the user to further evaluate implementing P2 at the facility.

Table B

Information for the Comments Column

- Suggest practice-specific implementation and compliance demonstration methodologies;
- Differentiate between similar practices within the same general heading (such as under “Reuse of Drum Rinsate”) in place at the facility;
- Discuss modification justifications; and
- Provide additional information for specific practices.

The following instructions contain suggested ways to use Table B, special items or information that can be sought out by the user, and important follow-up ideas, such as review of facility documentation. Where a P2 term has been defined and/or described in Chapter 3, the term is in *italicized bold* print.

1. Water Conservation

Examine how all rinsing operations are conducted at the facility, and determine whether the facility is taking any measures to minimize rinse-water flow.

- **1-1: Interior Equipment Rinsing**—Note the use of *spray nozzles* or other *flow reduction equipment (high-pressure/low-volume washers, spray balls, or steam cleaners)* that are used to rinse PFPR equipment interiors. Identify and note cases in which the facility would not be able to reuse rinsate, and if the facility has a wastewater treatment system that can treat small-volume interior rinsate discharges.

P2 Alternative Compliance

A modification to this practice is allowed if the facility is rinsing narrow transfer lines or piping where cleaning is better achieved by a water flush.

- **1-2: Floor Cleaning**—Identify the facility’s floor-washing procedures (e.g., if a *floor scrubber* is used) and identify and record the chemicals used to clean floors (e.g., water, detergent) in the “**Comments**” column.
- **1-3: Dry Process Cleaning Equipment**—Identify how dry production areas are cleaned. In particular, note the type of *dry process cleaning equipment* used, whether the production areas are swept or vacuumed prior to rinsing with water, or if the dry production areas are cleaned with water at all.

2. Good Housekeeping Practices

Identify and record all preventive maintenance, leak control, spill cleanup, and other *good housekeeping practices* used at the facility.

- **2-1: Preventive Maintenance**—Identify if the facility has written procedures regarding the maintenance schedule for each major valve and fitting, and whether they have documented the performance of the maintenance checks.
- **2-2: Valves/Fittings**—Identify if valves and leaky fittings have some form of containment (e.g., drip pans) to enable the reuse or disposal of collected product or wastewater.
- **2-3: Spill Cleanup**—Identify if the facility has prepared *training and written standard operating procedures* for cleanup of leaks and spills, and if the facility has records demonstrating quick cleanup of actual leaks and spills in outdoor bulk storage or process areas.

P2 Alternative Compliance

All records documenting training programs and preventive maintenance schedules should be attached to the completed P2 audit form.

Table B

3. Department of Transportation (DOT) Test Bath

If the facility produces aerosols that require the *operation of DOT test baths*, identify how the bath is operated. Note in the “**Comments**” column if the DOT test bath is operated as batch discharge. If the DOT test bath is operated in a continuous overflow mode, identify and note if the facility recirculates water back to the bath.

4. Air Pollution Controls

Identify if wet air scrubbers are operated with recirculation. Note the percent blowdown of the system in the “**Comments**” column.

5. Reuse of Drum Rinsate of Water-Based Products

Identify how empty drums or shipping containers are cleaned and handled at the facility. Note the ultimate disposal of the drums in the “**Comments**” column.

- **5-1: Direct Reuse of Drum Rinsate**—Note if the facility has implemented *direct reuse of drum rinsate* into product formulations from the triple rinsing of drums.
- **5-2: Storage and Reuse of Drum Rinsate**—Note if the facility collected drum and/or shipping container rinsate for reuse in subsequent formulations.

P2 Alternative Compliance

A modification to practices 5-1 and 5-2 is allowed if the facility is using a staged **drum rinsing station** that minimizes wastewater volume required for drum cleaning (typically 100 gallons for every 70 drums).

A modification is also allowed in a case where the drum/shipping container holds an inert ingredient(s) only, and 1) the facility can demonstrate that, even after using water conservation practices, there is more volume of water generated from rinsing the drums than can be reused in the formulation, or 2) the facility can demonstrate that the concentration of the inert ingredient in the formulation is so small (e.g., perfume) that the amount of inert ingredient in the rinsate is more than can be reused in the formulation without exceeding the ranges allowed in the Confidential Statement of Formula (CSF) (40 CFR 158.155). Note whether the facility reused as much rinsate as possible and whether the documentation on the formulation ingredients substantiates this modification.

Table B

- **5-3: Staged Drum Rinsing Station**—If the facility is using a staged drum rinsing station, briefly describe the system, including the amount of water contained in each cell and the frequency with which the water is changed.

The facility may use more than one drum rinsate P2 practice; discuss these practices in the “**Comments**” column.

6. Drum Rinsing for Formulation of Solvent-Based Products

This practice is similar to the practices detailed in Section 5 above, but it applies to the rinsing of drums or shipping containers containing solvents or solvent-based materials. Note the ultimate disposal of the drums or shipping containers in the “**Comments**” column.

- **6-1: Direct Reuse of Drum Solvent Rinsate**—Note if the facility has implemented *direct reuse of drum rinsate* into solvent-based product formulations.

P2 Alternative Compliance

A modification to these practices is allowed if the facility sends the drums and/or shipping containers to a refurbisher or recycler that only accepts drums triple rinsed with water. Note whether the facility has documentation from the drum recycler to substantiate this modification.

A modification is also allowed in a case where the drum/shipping container holds an inert ingredient(s) only, and 1) the facility can demonstrate that, even after using water conservation practices, there is more volume of base solvent generated from rinsing the drums than can be reused in the formulation, or 2) the facility can demonstrate that the concentration of the inert ingredient in the formulation is so small (e.g., perfume) that the amount of inert ingredient in the rinsate is more than can be reused in the formulation without exceeding the ranges allowed in the Confidential Statement of Formula (CSF) (40 CFR 158.155). Note whether the facility reused as much rinsate as possible and whether the documentation on the formulation ingredients substantiates this modification.

- **6-2: Cleaning Material**—Note the material used to clean the drums and if the material is the base solvent in one of the facility's formulations.
- **6-3: Storage and Reuse of Drum Solvent Rinsate**—Note if the facility collected drum solvent rinsate for reuse in subsequent formulations.

It is possible that the facility uses several different drum rinsate practices. Note each of these practices in the “**Comments**” column.

Table B

7. Dedicated Equipment for Solvent- and Water-Based Products

Determine if water-based and solvent-based products are formulated and packaged using *process equipment* dedicated by water-based and solvent-based production.

P2 Alternative Compliance

A modification to this practice is allowed if the product is only sporadically produced, such that the expense of dedicated equipment outweighs the P2 benefit. The facility should be able to demonstrate sporadic production through the use of production records. Note in the “**Comments**” column whether the documentation supports any claims of sporadic production. Another modification to this practice is allowed if the facility has installed and is operating a *solvent recovery system*.

8. Interior Rinsate Storage and Reuse

Identify if the facility uses *interior rinsate storage and reuse*, specifically noting if the rinsate is reused immediately in the next batch or is reused after being stored while other products are formulated and packaged.

P2 Alternative Compliance

Several modifications to the practice of storing and reusing interior rinsate are listed by code in Footnote 2 on Table B. List all reasons why the facility would not be able to reuse interior rinsate, and obtain documentation supporting these claims. Examples of this documentation include data demonstrating biological growth in stored rinsate, site plans illustrating space limitations precluding storage containers, manufacturer or original formulator directions requiring a specific form of disposal, or facility plans to drop the registration or production of a particular formulation. Document other reasons in the “**Comments**” column.

9. Dedicated Process Equipment (non-Table 8 practice)

If the facility is unable to reuse all interior rinsate (as identified by the user in Section 8 of the “**Practices**” column), indicate if the facility has used *dedication of process equipment* and *production scheduling* practices.

- **9-1: Equipment Dedication**—Identify if the facility has dedicated some equipment (e.g., mix tank or agitator) to (1) the top production formulation, (2) products that are hard to clean up after production, or (3) product families. Identify and record in the “**Comments**” column what pieces of process equipment are dedicated.

- **9-2: Production Sequencing**—Review production records to identify whether production sequencing is implemented and whether it reduces or eliminates the generation of equipment cleaning rinsates.

Table B

10. Inventory Management (non-Table 8 practice)

Inventory management systems for raw materials, finished products, and waste products typically include centralized sheltered storage, access controls (e.g., locked storage areas), and, in some cases, computerized inventory control. These systems increase wastewater reuse opportunities. Most, if not all, PFPR facilities have some degree of inventory management, although the increased use of “just-in-time” production may have decreased the need for inventory management at some facilities. However, an inventory management system is a key to using the P2 practice of *interior rinsate storage and reuse*.

- **10-1: Inventory Management System**—Identify if an inventory management system is in place at the facility.
- **10-2: System Control**—Identify which of the system controls listed in Section 10 of the “Practices” column are in place at the facility, and how these controls have benefited P2 at the facility. Also identify potential applications of inventory management to facilitate additional wastewater reuse.

11. Training and Written Standard Operating Procedures (non-Table 8 practice)

Employee *training and written standard operating procedures* and incentive programs have been shown to be useful tools in identifying and implementing P2 opportunities.

- **11-1: Training**—Identify if the facility has a formal P2 training program. The facility should be able to provide training materials and records of attendance to document that the program is operational.
- **11-2: Incentive Program**—Identify if the facility has employee incentive programs in place that encourage P2.
- **11-3: Implementation of P2**—Note if the facility has documentation of the implementation of the P2 practices summarized on Table B.

12. Other P2 Practices/Equipment

List and describe innovative or otherwise unique P2 techniques in the “Comments” column when these practices are not claimed as confidential. When the user is a permitting official or a facility with multiple locations, provide enough detail to determine if these practices could be used by other PFPR facilities.

Table C: Summary of PFPR Compliance Decisions

After completing Tables A and B, the user has the information necessary to make a preliminary compliance decision for each waste stream identified in Table A. The compliance options include zero discharge, P2 alternative, and P2 alternative with modification. Wastewater that is completely reused or recycled on or off site or is contract hauled for off-site disposal is considered zero discharge.¹ Waste streams that will be discharged to a POTW or receiving stream must comply with either the P2 alternative or the P2 alternative with modification.

The user should copy all of the sources for all stream types from Table A to Table C ("Source" column). Based on the information in Table A, the user can make the preliminary decision on whether the source is zero discharge. If the source is not zero discharge, then the user should evaluate the information in Table B to decide whether the P2 alternative can be implemented, with or without modification. In the column entitled "Preliminary Compliance Decision", write "P2 alternative", "P2 alternative with mod", or "Zero discharge."¹ If "P2 alternative with mod" is selected, write the applicable modification code in the "Comments" column. Figure 4-7 presents an example of the preliminary compliance decisions for the example sources presented previously in Table A.

Table C

Table C: Summary of PFPR Compliance Decisions

Facility: _____		Location: _____				
Date: _____		Prepared by: _____				
Stream Type	Source	Preliminary Compliance Decision	Comments ¹	Wastewater to be Treated?	Final Compliance Decision	Approval Date for Nonlisted Modifications
1. Shipping Container/ Drum Cleaning - water or solvent rinses of the containers used to ship raw material, finished products, and/or waste products prior to reuse or disposal of the containers.	1.a. <i>atrazine, metolachlor, and inert drums</i>	<i>Zero discharge</i>				
	1.b. <i>copper naphthenate and solvent drums</i>	<i>P2 alternative with modification</i>	<i>REFURB - Drum refurbisher will not accept solvent-rinsed drums</i>			
2. Bulk Tank Rinsate - cleaning of the interior of any bulk storage tank containing raw materials, intermediate blends, or finished products associated with PFPR operations.	2.a.					
	2.b.					
3. Formulating Equipment Interior Cleaning - routine cleaning, cleaning due to product changeover, or special cleaning of the interior of any formulating equipment, including formulation and/or storage tanks, pipes, and hoses. Cleaning materials may include water, detergent, or solvent.	3.a. <i>liquid formulation tank # 1</i>	<i>Zero discharge</i>	<i>Dedicate Tank # 1 to solvent-based fungicide production</i>			
	3.b. <i>liquid formulation tank # 2</i>	<i>P2 alternative with mod</i>	<i>BIOGROWTH Dedicate Tank # 2 and # 3 to herbicide production</i>			
	3.c. <i>liquid formulation tank # 3</i>	<i>P2 alternative with mod</i>	<i>BIOGROWTH Dedicate Tank # 2 and # 3 to herbicide production</i>			
	3.d. <i>dry formulation tank</i>	<i>P2 alternative</i>				

¹ Insert the following modification codes in the column titled "Comments":

ALTDIPOSE, BIOGROWTH, BREAKAA, DETERGENT, DROP, INERT, NARROW, PACKAGE, RECOVERY, REFURB, SPACE, OTHER

(Modification Code Sheet at end of table contains a detailed explanation of each code.)

Figure 4-7. Making Preliminary Compliance Decisions

¹ Note: In the example in Figure 4-7, "Zero Discharge" rather than "P2 Alternative" is entered for any stream that is completely reused. This convention was chosen to differentiate between streams that are not discharged and streams that may be discharged and, therefore, may require treatment. Alternatively, wastewater that is completely recycled or reused could be recorded as "P2 Alternative."

If the preliminary compliance decision is zero discharge for all waste streams at the facility, and the facility is not interested in implementing the P2 alternative, the user can skip to Chapter 7 for the discussion on compliance paperwork. If the facility decides to implement the P2 alternative or P2 alternative with modification for any of its waste streams, the user should continue to Chapters 5 and 6 to evaluate treatment technologies appropriate for the allowable discharge. The remaining columns are discussed in Chapters 6 and 7, as facilities should assess their need for treatment and the associated costs prior to making their final compliance decision.